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Results of Legume Extension in Three Southeast  
Missouri Counties Representing Three Stages in  
the Development of a State-wide Legume Program

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RESULTS OF LEGUME EXTENSION  
IN THREE SOUTHEAST MISSOURI COUNTIES  
REPRESENTING THREE STAGES IN THE DEVELOPMENT  
OF A STATE-WIDE LEGUME PROGRAM

A Study of 639 Farms in Cape Girardeau,  
Jefferson and Scott Counties, Missouri, 1930.

M. C. Wilson<sup>1/</sup> and Ide P. Trotter<sup>2/</sup>

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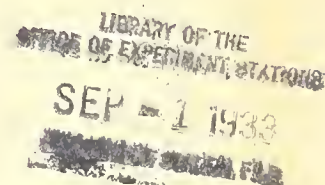
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## SCOPE OF STUDY

The growing of leguminous crops holds an important place in the agriculture of Missouri both as forage for livestock and as a means of improving the fertility of the soil. Naturally the extension program over a period of years has emphasized the introduction and successful growing of the various legumes adapted to the different sections of the State.

Data are presented in this circular regarding the situation in representative areas of three southeast Missouri counties, as to the legumes being grown and the cultural practices followed. These areas represent three stages in the development of a state-wide legume program. The study reported deals also with the effectiveness of the legume extension program in influencing farmers to start growing legumes, or to grow them more successfully if legumes were already being grown. The means and agencies employed in legume extension have been analyzed both from the standpoint of the dissemination of extension information to farmers and from the standpoint of actually influencing farmers to accept the improved legume growing practices advocated by the extension service.

In addition to furnishing specific information regarding the adaptability of the various teaching means and agencies the study brings out more clearly than previous studies how various factors influence the extent to which the individual teaching means and agencies are successful in getting extension information before farmers; the ratio of takes to exposures; and the cumulative effect of variation and repetition in the effective presentation of extension information.

## COLLECTION OF DATA

The field data were collected during November, 1930, using the personal interview survey method. A total of 639 farm records were obtained, 249 in Cape Girardeau county, 173 in Scott county, and 217 in Jefferson county.

Prior to the collection of the field data, a careful analysis was made of the legume extension program as conducted throughout the State and particularly in those counties which were finally selected for this study. The questionnaire was worked out in cooperation with the crops and soils specialists of the Missouri College of Agriculture and those extension administrative and supervisory officers most closely informed regarding the extension programs and accomplishments in the section of the State involved.

Those participating in the collection of data were crops and soils specialists, the district extension supervisor, experienced county agents from nearby counties, and representatives of the Federal extension service familiar with the survey method of collecting information.

Prior to going to the field, the members of the survey party were schooled in the use of the questionnaire (Fig. 1a and 1b) and the legume extension programs and activities in the area being studied were thoroughly reviewed. Conferences were held each night to insure uniform treatment of

information, and each day records for the preceding day were checked for incompleteness and inconsistency, and additional information obtained where necessary.

## LEGUME EXTENSION AS CONDUCTED IN MISSOURI

Prior to 1921 extension work in soils and crops in Missouri was promoted by two extension specialists, one located in the soils department and one in the crops department, each working independently. These specialists worked largely through approximately 60 county agricultural agents who were cooperatively employed by the counties, the Missouri College of Agriculture, and the United States Department of Agriculture. Crops and soils extension activities in counties without agricultural agents were confined to farmers' institute type of meetings and answering miscellaneous calls.

In order to bring about proper coordination of the soils and crops extension program for the State, the plan was perfected in 1921 whereby the two extension specialists concerned combined their programs, each assuming responsibility for the entire soils and crops extension activities in the counties visited. To further increase the efficiency of both the specialists and the county agricultural agents in conducting the soils and crops extension program, it was decided to concentrate extension effort upon certain limited phases of the program which were of major importance and generally applicable to the entire State. The growing of legumes for forage and soils improvement was selected for this state-wide emphasis and steps were outlined for the prosecution of the work on a systematic long-time basis.

The detailed plan <sup>1/</sup>for carrying out the "Clover and Prosperity" program or campaign, as it was called, involved three general stages:

1. The propaganda phase to arouse interest and convince farmers of the value of legumes.
2. The educational phase to demonstrate the place of legumes in a system of farming and how to grow them.
3. The adoption phase to secure the acceptance of the practice by farmers generally.

Emphasis was first placed upon an intensive publicity campaign built around "Clover and Prosperity Days" and a county legume acreage contest. The "Clover and Prosperity Day" was in the nature of a launching meeting held during the summer or early fall designed to draw a large attendance and start the project in a county.

The following winter, county-wide clover and prosperity conferences were held composed of leading farmers selected to represent each school district in the county. The discussion or conference method was employed to bring out local soils and crops problems and to outline a legume program for the county.

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<sup>1/</sup> Carter, C. E. and Schowengördt, P. F.. "A State-wide Campaign for More Legumes." The Journal of the American Society of Agronomy, Vol. 17, No. 7, July, 1925.



No. \_\_\_\_\_ Co. \_\_\_\_\_ SURVEY OF RESULTS OF LEGUME EXTENSION Date \_\_\_\_\_  
 Name \_\_\_\_\_ Address \_\_\_\_\_ Community \_\_\_\_\_  
 Kind of road: All-weather \_\_\_\_\_ Imp. \_\_\_\_\_ Unimp. \_\_\_\_\_ Miles to agt's office \_\_\_\_\_ Acres in cult. \_\_\_\_\_  
 No. livestock: Dairy \_\_\_\_\_ Beef \_\_\_\_\_ Sheep \_\_\_\_\_ Hogs \_\_\_\_\_ Work \_\_\_\_\_ Poultry \_\_\_\_\_ Years: This farm \_\_\_\_\_  
 Owner \_\_\_\_\_ Tenant \_\_\_\_\_ Papers taken: Daily \_\_\_\_\_ Weekly \_\_\_\_\_  
 Farm \_\_\_\_\_ Phone \_\_\_\_\_ Radio \_\_\_\_\_ From what station is useful farm in-  
 formation obtained \_\_\_\_\_ Are acre yields now larger (L) or smaller (S)  
 than when you moved on this farm: for Corn \_\_\_\_\_ Wheat \_\_\_\_\_ Legumes \_\_\_\_\_ How many times  
 in last 5 years have you seeded clover \_\_\_\_\_ sweet clover \_\_\_\_\_ alfalfa \_\_\_\_\_ No. successful stands:  
 clover \_\_\_\_\_ sweet clover \_\_\_\_\_ alfalfa \_\_\_\_\_ What are chief causes of failure \_\_\_\_\_  
 Which alfalfa seeding gives best results: Fall \_\_\_\_\_  
 Spring \_\_\_\_\_ Legume demonstration ever conducted on farm \_\_\_\_\_ Ever been a C and P dele-  
 gate \_\_\_\_\_

Acres of legumes grown and practices followed ; Year began using. (Use year 1920									
	No.	1929	1924	for all years earlier than 1920)					
	years:	Acres	Yield	Acres:	Inoc-	Comm.	Im-		
	grown:	Grown	hay	grown:	ula-	Lime:fert-	Manure:	proved	
		per acre:		tion	ilizer:		seed		
Soybeans	:	:	:	:	:	:	:	:	:
Clover and timothy	:	:	:	:	:	:	:	:	:
Mixed clover	:	:	:	:	:	:	:	:	:
Red clover	:	:	:	:	:	:	:	:	:
Sweet clover	:	:	:	:	:	:	:	:	:
Alfalfa	:	:	:	:	:	:	:	:	:
Korean lespedeza	:	:	:	:	:	:	:	:	:
Cowpeas	:	:	:	:	:	:	:	:	:
Other legumes	:	XX	:	XX	:	XX	XX	XX	XX

Figure 1a. - Obverse side of questionnaire card used in collecting data.

Acres legumes grown for green manure: 1929 \_\_\_\_\_ 1924 \_\_\_\_\_ Year first tested soil for  
 acidity \_\_\_\_\_ Do you test each field before liming? \_\_\_\_\_ Tons limestone used in 1929 \_\_\_\_\_  
 Tons used this farm last 10 years \_\_\_\_\_ How far do you haul limestone \_\_\_\_\_ Have a lime  
 spreader \_\_\_\_\_ Have a limestone crusher \_\_\_\_\_ Tons fertilizer used in 1929 \_\_\_\_\_ Have a fer-  
 tilizer drill \_\_\_\_\_ On what field crops other than legumes do you ordinarily use com-  
 mercial fertilizer \_\_\_\_\_  
 Check extension activities relating to legume growing attended, or personal contacts  
 with extension workers regarding legume growing: result demonstration(dem.a.) \_\_\_\_\_  
 Method demonstration meeting (m.dem.) \_\_\_\_\_ C & P Conf.(C.P.) \_\_\_\_\_ Other meetings(mtg.) \_\_\_\_\_  
 Bulletin(bul.) \_\_\_\_\_ Office call(o.c.) \_\_\_\_\_ Farm visit(f.v.) \_\_\_\_\_ Circular letter(cir.l.) \_\_\_\_\_  
 News story(n.s.) \_\_\_\_\_ Exhibit(exh.) \_\_\_\_\_ Telephone(tel.) \_\_\_\_\_ Correspondence(cor.) \_\_\_\_\_  
 Radio talk(r.) \_\_\_\_\_ Poster(p.) \_\_\_\_\_ Indirect(Ind.) \_\_\_\_\_

Check opposite each crop below the extension means or agencies  
 which influenced the adoption of the practices named.

Crop	Practices aiding successful production					
	Introduction:	Inoculation:	Line	Fertilizer:	Manure	Good seed
Soybeans	:	:	:	:	:	:
Mixed clover	:	:	:	:	:	:
Red clover	:	:	:	:	:	:
Sweet clover	:	:	:	:	:	:
Alfalfa	:	:	:	:	:	:
Korean lespedeza:	:	:	:	:	:	:
Cowpeas	:	:	:	:	:	:
Other legumes	:	:	:	:	:	:
Attitude toward extension:	Favorable _____	Ind. _____	Opp. _____			
Age _____	Education: Com. _____	H.S. _____	Coll. _____			

Extension Services of the United States Department of Agriculture, and the College of  
 Agriculture, University of Missouri, cooperating, November, 1930.

Figure 1b. - Reverse side of questionnaire card used in collecting data.

A few carefully planned long-time legume demonstrations were established with volunteer demonstrators and were systematically followed up. The second winter these same local legume leaders were called to a second clover and prosperity conference, at which time this legume program was reviewed and reconsidered, progress reports were made, and plans outlined for continuing the work throughout the succeeding year. Similar conferences, held annually thereafter, were comprised as nearly as practicable of the original delegate group.

Thus the program was inaugurated and developed. It was expanded into new counties year by year until by 1930 it was reaching 96 of the 114 counties of Missouri, which represented six different stages of annual progress. About 11,000 local leaders participate annually in the clover and prosperity conference and the county legume programs.

The number of soils and crops specialists was increased from two in 1921 to five in 1930, each being placed in charge of the legume program in a certain number of counties. These specialists assist in conducting the clover and prosperity program in Missouri, whether or not there is a local county agricultural agent. In non-agent counties the program is developed through any farmers' organization which shows a willingness to cooperate; or, lacking that, a special group is organized for the purpose.

#### Status of Legume Extension in Areas Studied.

The three counties selected for this study (Fig. 2) represented three stages of the development of a state-wide legume extension program. Otherwise, they were as nearly comparable as possible with regard to soil type, character of population, and other significant factors. All had had a county agricultural agent for a period of years extending back well beyond the coordination of the soils and crops extension programs in 1921.

Scott County was selected as typical of the conduct of legume extension by the county agricultural agent without participation in the regular state-wide clover and prosperity program. Legume work had a major place in the county extension program but no special teaching effort of an organized character similar to the clover and prosperity program had been used.

Cape Girardeau County represented those sections of the State where the clover and prosperity program had been conducted for three years. The part of the county surveyed adjoined the area of Scott County included in the study.

Jefferson County was chosen as representative of those counties which started the original legume program at its inception, and which at the time of the collection of the field data had been conducting the program for six years.



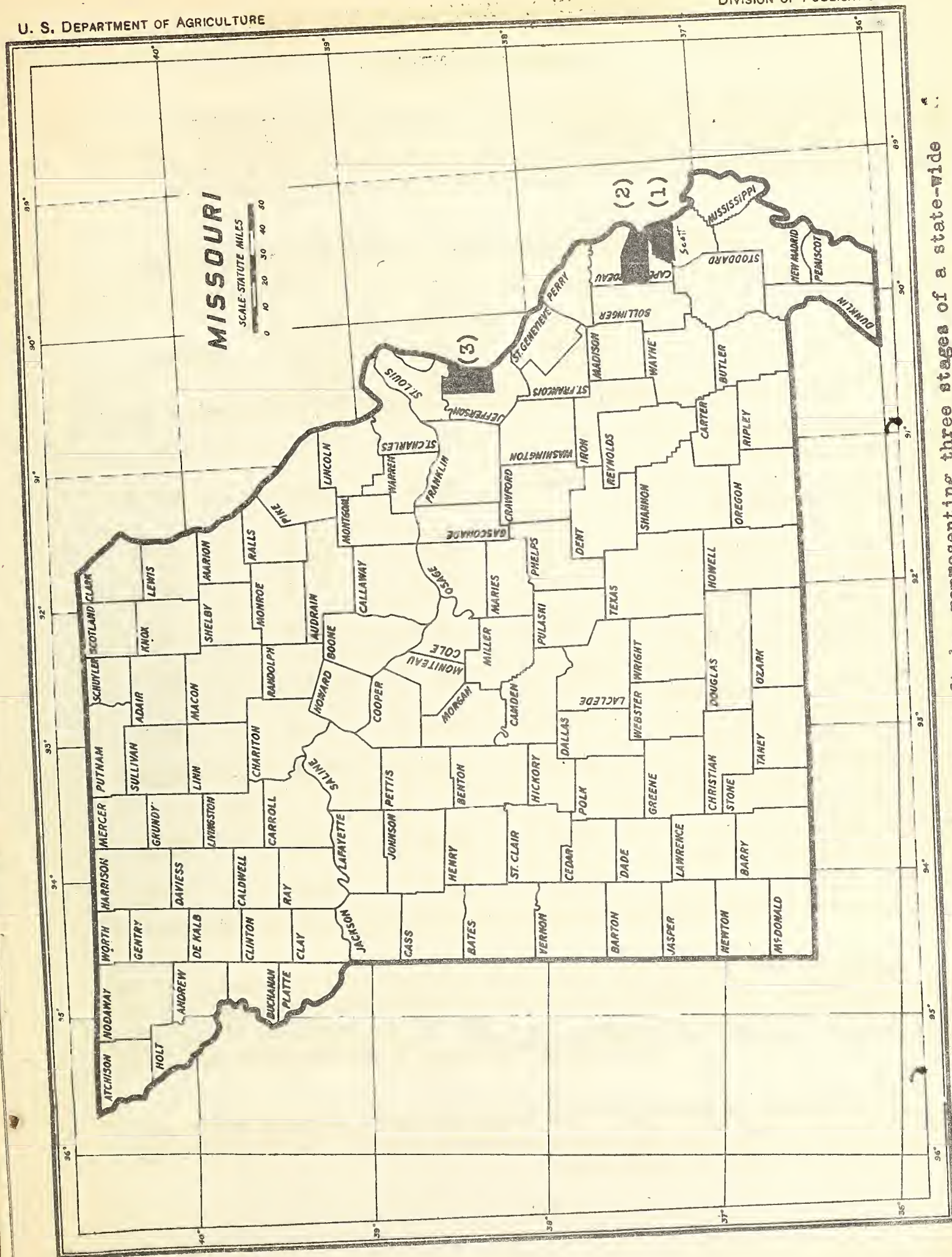


Fig. 2. - Areas included in Legume Study, representing three stages of a state-wide legume program: (1) Scott County, no legume conference program; (2) Cape Girardeau County, three years of a legume conference program; (3) Jefferson County, six years of a legume conference program.

# SITUATION ON FARMS INCLUDED IN STUDY

## General Information

Slightly more than three-fourths of the 639 farms included in the study were owner operated, the remainder being operated by tenants on a share-crop or cash-rent basis. The highest proportion of tenant operators was in the Scott County area and the lowest in the Jefferson area. (Table 1.)

Table 1. - General information regarding farms included in study.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Farm records obtained . . . .	173	249	217	639
Percentage operated by owner . . . . .	68.2	76.3	82.9	76.4
Percentage operated by tenant . . . . .	31.8	23.7	17.1	23.6
Percentage with telephone	52.0	77.1	19.4	50.7
Percentage with radio . . . .	16.2	36.1	43.3	33.2
Average miles to county extension office . . . . .	5.7	6.8	15.2	9.3
Average acres in cultiva- tion . . . . .	102	106	63	90
Average years operator has farmed present farm . . . .	16.0	16.8	16.2	16.4
Percentage located on all- weather roads . . . . .	37.0	54.6	70.5	55.2
Percentage located on im- proved but not all- weather roads . . . . .	49.7	33.3	26.3	35.4
Percentage located on un- improved roads . . . . .	13.3	12.0	3.2	9.4

Approximately half of the homes were equipped with telephones and one-third with radios. The highest percentage of homes with telephones was in the Cape Girardeau County area, and the lowest in the Jefferson County area. Radios were most common in the Jefferson area and least common in the Scott area.

In the Cape Girardeau and Scott areas the farms averaged seven and six miles respectively from the county extension office. In the Jefferson area the farms averaged 15 miles away.



The farms in the Jefferson area averaged 63 acres in cultivation, whereas in the other two areas, acres in cultivation exceeded 100 on the average. From the standpoint of length of time operators had lived on their present farms, all three areas were quite similar, the average length of tenure being between 16 and 17 years.

Seventy percent of the farms in the Jefferson area were located on roads, passable under all weather conditions. Only three percent were located on unimproved roads. Road conditions in the Cape Girardeau area were quite similar to the Scott area, both these areas having somewhat poorer roads than the Jefferson area.

#### Livestock Kept

Practically all of the farms included in the study kept some livestock. In the Jefferson area greater emphasis was placed upon dairying with fewer beef cattle, sheep, and hogs than in the other two areas. The total amount of livestock kept per farm was quite similar in all three areas, averaging about 16 animal units. (Table 2.)

Table 2. - Amount of livestock kept on farms included in study.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Average number livestock kept				
Dairy .....	4.9	6.9	8.5	6.9
Beef .....	2.8	2.7	0.2	1.9
Sheep .....	2.1	2.1	1.0	1.7
Hogs .....	18.3	16.1	4.6	12.8
Work animals .....	4.1	4.3	2.6	3.7
Poultry .....	88.4	146.5	142.5	129.4
Percentage of farms with no livestock .....	0.6	0.8	-	0.5

#### Changes in Acre Yields of Crops

That acre yields of corn, wheat, and legumes were smaller than when they moved to their present farms some 16 years before was the opinion of approximately 40 percent of the farmers interviewed. One farmer in four stated that acre yields of corn and legumes were larger. One farmer in eight stated that wheat yields were larger. (Table 3.) A higher percentage of farmers in Scott County than in the other two counties reported acre yields of corn, wheat, and legumes smaller than formerly.

Table 3. - Changes in acre yields of crops  
since present operator moved on farm

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Percentage of farms reporting acre yields of corn:				
Larger .....	13.3	26.5	24.9	22.4
Smaller .....	54.9	43.4	35.5	43.8
No change .....	31.8	30.1	39.6	33.8
Percentage of farms reporting acre yields of wheat:				
Larger .....	9.8	14.9	12.9	12.8
Smaller .....	52.6	38.6	30.4	39.6
No change .....	37.6	46.5	56.7	47.6
Percentage of farms reporting acre yields of legumes:				
Larger .....	19.1	28.1	24.4	24.4
Smaller .....	45.7	43.0	40.1	42.7
No change .....	35.2	28.9	35.5	32.9

#### Success with Legume Seeding

Red clover was seeded approximately four years out of every five on the average on the farms for which data were obtained. This practice was quite uniform in all three areas. Alfalfa was seeded about once in three years in the Jefferson area and much less frequently in the other two areas. (Table 4.) Those sowing alfalfa obtained successful stands in 70 percent of the cases, fall seedings being somewhat more successful than spring seedings. Good clover stands were obtained in 62 percent of the instances, and sweet clover in 58 percent.

The average farm grew about two and three-fourths acres of legumes for green manure and the acreage of legumes for such purpose increased 51 percent during the period 1924 to 1929.

Table 4. - Success with legume seedings on farms in areas studied.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Average number times during last five years seeded for:				
Clover .....	3.9	4.0	3.7	3.9
Sweet clover .....	0.2	0.3	0.4	0.3
Alfalfa .....	0.1	0.3	1.5	0.7
Percentage of successful stands obtained:				
Clover .....	67.6	62.4	56.9	62.1
Sweet clover .....	47.4	51.2	63.4	55.5
Alfalfa .....	21.7	71.3	73.2	70.1
Percentage reporting best re- sults when alfalfa was seeded:				
Fall .....	1.7	12.9	15.7	10.8
Spring .....	1.2	1.6	14.7	5.9
Average acreage legumes grown for green manure 1929 .....	2.5	3.0	2.5	2.7
Percentage increase 1929 over 1924 .....	45.6	43.3	67.3	50.8

#### Causes of Failure of Legume Seedings

Weather conditions were cited by farmers as the chief causes for failure in obtaining and holding stands of legumes. (Table 5.) The prevalence of drought conditions throughout the area during 1930 doubtless accounted for the frequency with which drought was mentioned. Lack of lime was the only other cause mentioned by a substantial percentage of the farmers interviewed, though a small number mentioned general soil conditions and lack of fertilizer. The causes for failure of legumes were apparently the same in all three county areas studied. The percentage of farmers attributing legume failure to specific causes other than weather, and which are therefore subject to control, seems to bear a direct positive relationship to the stage of development of the legume program in the area.



Table 5. - Percentage of farmers giving causes for legume failure.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Drought .....	52.6	55.0	38.7	48.8
Weather .....	16.8	15.1	13.4	15.3
Freeze .....	4.6	7.2	8.3	6.9
Total uncontrollable factors	74.0	78.3	60.4	71.0
Lack of lime .....	12.7	16.9	35.0	21.9
Soil conditions .....	2.3	5.6	7.4	5.3
Lack of fertilizer .....	0.6	2.8	8.9	3.6
Poor seed .....	1.2	2.0	4.6	2.7
Total controllable factors	16.8	27.3	53.9	33.5

#### Use of Lime and Commercial Fertilizer

At one time or another 19 percent of the farmers had tested soil for acidity before liming. Only 8 percent of the farmers follow the practice of testing each field for acidity before applying lime. Eighteen percent of the farmers interviewed had applied an average of 26 tons of limestone per farm in 1929. About one-third of the farmers had used an average of 48 tons of limestone per farm during the 10 years previous to the collection of these data. Limestone had to be hauled an average distance of 5 miles to the farms. One farm in 8 owned a lime spreader.

The percentage of farmers using lime was highest for the Jefferson area and lowest for the Scott area. (Table 6.) Approximately 12 percent of all farms used commercial fertilizer in 1929, the highest percentage being in the Jefferson area and the lowest in the Scott area. The average fertilizer consumption in 1929, considering all farms studied was 411 pounds. Nearly 5 percent of the farms reported fertilizer drills. Approximately twice as many farmers used commercial fertilizer for wheat, as used it for either corn or potatoes. Ten percent of the farmers used fertilizer on other crops than legumes.



Table 6. - Extent of use of lime and commercial fertilizer on farms studied.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Percentage of farmers testing soil for acidity before liming (ever) .....	22.5	14.1	22.6	19.2
Percentage of farmers testing soil of each field before liming .....	6.9	4.8	13.4	8.3
Percentage of farmers using limestone 1929 .....	7.5	15.3	30.9	18.5
Average number tons used 1929 per farm using limestone ..	22.6	22.9	29.3	26.5
Percentage of farmers using limestone during past 10 years .....	17.3	29.3	49.3	32.9
Average number tons limestone used past 10 years per farm using limestone .....	30.2	47.0	54.5	43.4
Average miles limestone hauled	7.5	4.7	4.0	4.8
Percentage of farms with lime spreader .....	4.0	11.6	18.9	12.0
Percentage of farms with limestone crusher .....	-	-	2.3	0.8
Percentage of farms using commercial fertilizer 1929	5.2	10.0	18.4	11.6
Average number pounds fertilizer used per farm using commercial fertilizer .....	2194	3693	3771	3553
Percentage of farms with a fertilizer drill .....	1.7	5.2	6.5	4.7

## Status of Legume Growing in Areas Studied.

A record was made of the year, if since 1920<sup>1/</sup>, when the growing of each of the legume crops was started, also of the acreages of the various legumes grown in 1929 as compared to six years previously. Detailed information was also obtained regarding the specific practices being followed with each crop and the year, if since 1920, when the practice was adopted. (Table 7.)

Soybeans. The growing of soybeans was more common in the Scott and Jefferson areas than in the Cape Girardeau area. The increase in number of farmers growing soybeans was greatest in Scott County. The increase in acreage of soybeans grown during the 6-year period was proportionately greater in all areas than the increase in the number of soybean growers. Slightly less than a third of the soybean growers used improved seed. Approximately 19 percent inoculated the seed. Manure was applied for soybeans on 13 percent of the farms growing soybeans.

Clover and timothy. Over one-third more farmers were mixing clover seed with timothy seed in 1929 than in 1924. More than half those following this practice applied manure for the crop. Nearly one-third used improved seed.

Mixed clover. The growing of red and alsike, or other clovers in mixture which has been recently advocated as a substitute for clover and timothy was not a common procedure in any of the areas, though the number of farmers following this practice increased substantially between 1924 and 1929.

Red clover. From two-thirds to three-fourths of the farmers interviewed in the three areas reported growing red clover. The growing of this crop seems to be again on the increase since there were 35 percent more farmers growing the crop in 1929 than in 1924. Manure was used for this crop by 43 percent of the growers, improved seed by 28 percent, and lime by 24 percent.

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<sup>1/</sup> No attempt was made to record the actual year farmers began growing the legumes, if prior to 1920.

Table 7. - Status of legume growing in areas studied.

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
<u>Soybeans</u>								
Farms growing, 1920 - 1930 ... 1/	86	49.7	68	27.3	92	42.4	246	38.5
Increase in farms growing, 1924-1929	45	750.0	16	100.0	29	96.7	90	173.1
Increase in acreage, 1924-1929	652	1811.1	277	177.6	179	85.4	1108	276.0
Soybean growers using:								
Inoculation	7	8.1	12	17.6	27	29.4	46	18.7
Lime	1	1.2	2	2.9	9	9.8	12	4.9
Commercial fertilizer	-	-	1	1.5	3	3.3	4	1.6
Manure	7	8.1	14	20.6	11	12.0	32	13.0
Improved seed	22	25.6	27	39.7	27	29.4	76	30.9
<u>Clover and timothy</u>								
Farms growing	55	31.8	153	61.4	42	19.4	250	39.1
Increase in farms growing, 1924-1929	14	48.3	39	37.9	5	17.8	58	36.2
Increase in acreage, 1924-1929	295	72.2	728	33.3	102	35.2	1125	39.0
Clover and timothy growers using:								
Inoculation	2	3.6	6	3.9	2	4.8	10	4.0
Lime	3	5.4	18	11.8	8	19.0	29	11.6
Commercial fertilizer	-	-	9	5.9	3	7.1	12	4.8
Manure	20	36.4	98	64.0	17	40.5	135	54.0
Improved seed	11	20.0	61	39.9	7	16.7	79	31.6

1/ No attempt was made to record the actual year farmers began growing the legumes, if prior to 1920.

Table 7. - Status of legume growing in areas studied - Continued

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
<u>Mixed clover</u>								
Farms growing .....	11	6.4	24	9.6	22	10.1	57	8.9
Increase in farms growing, 1924-1929 .....	4	400.0	16	85.7	12	200.0	22	157.1
Increase in acreage, 1924-1929	49	400.0	27	31.4	14	14.1	90	45.2
Mixed clover growers using:								
Inoculation .....	-	-	2	8.3	2	9.1	4	7.0
Lime .....	-	-	2	8.3	4	18.2	6	10.5
Commercial fertilizer .....	-	-	-	-	3	13.6	3	5.3
Manure .....	2	18.2	7	29.2	4	18.2	13	22.8
Improved seed .....	1	9.1	11	45.8	5	22.7	17	29.8
<u>Red clover</u>								
Farms growing .....	136	78.6	171	68.7	161	74.2	468	73.2
Increase in farms growing, 1924-1929 .....	35	40.2	43	46.7	21	19.8	99	34.7
Increase in acreage, 1924-1929	652	39.8	580	38.0	179	14.1	1410	31.8
Red clover growers using:								
Inoculation .....	-	-	5	2.9	12	7.4	17	3.6
Lime .....	14	10.3	37	21.6	61	37.9	112	23.9
Commercial fertilizer .....	1	0.7	12	7.0	19	11.8	32	6.8
Manure .....	52	38.2	93	54.4	56	34.8	201	42.9
Improved seed .....	28	20.6	67	39.2	38	23.6	133	28.4



Table 7. - Status of legume growing in areas studied - Continued

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total				
	Number	Percentage	Number	Percentage	Number	Percentage		
<u>Sweet clover</u>								
Farms growing .....	18	10.4	30	12.0	35	16.1	83	13.0
Increase in farms growing, 1924-1929 .....	2	40.0	16	300.0	21	525.0	39	354.5
Increase in acreage, 1924-1929	37	148.0	106	246.5	200	689.6	343	353.6
Sweet clover growers using:								
Inoculation .....	8	44.4	12	40.0	9	25.7	29	34.9
Lime .....	8	44.4	15	50.0	16	45.7	39	47.0
Commercial fertilizer .....	1	5.6	5	16.7	4	11.4	10	12.0
Manure .....	3	16.7	9	30.0	9	25.7	21	25.3
Improved seed .....	8	44.4	16	53.3	14	40.0	38	45.8
<u>Alfalfa</u>								
Farms growing .....	20	11.6	50	20.1	140	64.5	210	32.9
Increase in farms growing, 1924-1929 .....	4	133.3	16	123.1	42	79.2	62	89.8
Increase in acreage, 1924-1929	28	2260.0	110	161.3	199	71.6	338	97.3
Alfalfa growers using:								
Inoculation .....	5	25.0	30	60.0	65	46.4	100	47.6
Lime .....	9	45.0	36	72.0	76	54.3	121	57.6
Commercial fertilizer .....	4	20.0	7	14.0	29	20.7	40	19.0
Manure .....	6	30.0	26	52.0	42	30.0	74	35.2
Improved seed .....	10	50.0	32	64.0	54	38.6	96	45.7

Table 7. - Status of legume growing in areas studied - Continued

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
<u>Korean lespedeza</u>								
Farms growing .....	2	1.2	3	1.2	-	-	5	0.8
Increase in farms growing, 1924-1929 .....	-	-	-	-	-	-	-	-
Increase in acreage, 1924-1929 .	-	-	7	140.0	-	-	7	140.0
Korean lespedeza growers using:								
Inoculation .....	-	-	-	-	-	-	-	-
Lime .....	-	-	-	-	-	-	-	-
Commercial fertilizer .....	-	-	-	-	-	-	-	-
Manure .....	-	-	-	-	-	-	-	-
Improved seed .....	-	-	-	-	-	-	-	-
<u>Cowpeas</u>								
Farms growing .....	69	39.9	58	23.3	75	34.6	202	31.6
Increase in farms growing, 1924-1929 .....	4	11.8	4	11.4	5	8.9	13	10.4
Increase in acreage, 1924-1929 <sup>1/</sup>	-35	-9.5	-24	-7.6	-14	-4.6	-73	-7.4
Cowpeas growers using:								
Inoculation .....	-	-	1	1.7	-	-	1	0.5
Lime .....	1	1.4	1	1.7	-	-	2	1.0
Commercial fertilizer .....	-	-	-	-	-	-	-	-
Manure .....	2	2.9	8	13.8	3	4.0	13	6.4
Improved seed .....	1	1.4	3	5.2	-	-	4	2.0

<sup>1/</sup> Minus sign denotes decrease.

Table 7. - Status of legume growing in areas studied - Continued

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total
	Number	Percentage	Number	Percentage	Number	Percentage	Number: Percentage
<u>Other legumes</u>							
Farms growing .....	5	2.9	32	12.8	6	2.8	43 6.7
Increase in farms growing, 1924-1929 1/ .....	-3	-75.0	2	10.0	4	200.0	3 11.5
Increase in acreage, 1924-1929 ..	-31	-88.6	-41	-17.4	10	108.3	-62 -22.2
<u>Any legume</u>							
Farms growing .....	166	96.0	236	94.8	214	98.6	616 96.4
Increase in farms growing, 1924-1929 .....	36	31.0	56	32.9	33	19.8	125 27.6
Increase in acreage, 1924-1929 ..	1647	65.3	1770	38.3	868	34.8	4285 44.5
Any legume growers using:							
Inoculation .....	16	9.6	45	19.1	79	36.9	140 22.7
Lime .....	26	15.7	71	30.1	105	49.1	202 32.8
Commercial fertilizer .....	5	3.0	24	10.2	39	18.2	68 11.0
Manure .....	71	42.8	151	64.0	89	41.6	311 50.5
Improved seed .....	52	31.3	127	53.8	81	37.8	260 42.2

1/ Minus sign denotes decrease.

Sweet clover. Although but 13 percent of the farmers reported growing sweet clover during the 11 years included in the study, there was a large percentage increase in the number of sweet clover growers in 1929 over 1924. The use of lime and improved seed was reported by slightly less than half of the growers. One-third inoculated and one-fourth applied manure for this crop.

Alfalfa. The Jefferson area stands out in the percentage of farmers growing alfalfa at any time during the period included in the study. The number of alfalfa growers and the acreage of alfalfa grown in the three areas nearly doubled between 1924 and 1929. The use of lime was reported by 58 percent of the growers; inoculation of seed by 48 percent; improved seed, 46 percent; manure, 35 percent; and commercial fertilizer, 19 percent.

Cowpeas. Nearly one-third of the farmers in the three areas grew cowpeas more or less regularly. The number of farmers growing this crop increased slightly between 1924 and 1929 but there was a slight falling off in acreage grown during that period.

Any legume. When all legume crops were considered together it was found that 93 percent of the farmers grew some of the legumes more or less regularly. Comparing the two years 1924 and 1929 the number of farmers growing some legume during the later year was 28 percent greater than during the earlier year.

#### INFLUENCE OF LEGUME EXTENSION

Approximately one farmer in 33 interviewed reported conducting a legume demonstration under the supervision of extension workers. One farmer in 13 had served as a delegate to a county-wide clover and prosperity conference. These proportions were highest in Jefferson County where six such conferences had been held and lowest in Scott County where none had been held. (Table 3.) Considering all the various means and agencies employed in legume extension, 90 percent of the farmers in the Cape Girardeau area, 92 percent in the Scott area, and 97 percent in the Jefferson area had directly or indirectly come in contact with or had been otherwise informed about the legume extension program.



Table 8. - Percentage of farmers conducting result demonstrations or serving as local leaders.

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Percentage of farms conducting legume demonstrations .....	1.2	2.0	6.0	3.1
Percentage of farmers serving as delegates to county-wide clover and prosperity conferences .....	0.6	8.8	12.4	7.8
Percentage of farmers in any way exposed to legume extension .....	92.5	90.0	97.2	93.1
Percentage of farmers adopting improved legume practices due to extension influence .....	60.7	59.8	72.8	64.5
Number of legume practices adopted per 100 farms .....	151	211	254	210

The following of one or more of the recommendations of the extension service was reported by 60 percent of the farmers in the Cape Girardeau, 61 percent in the Scott, and 73 percent of the farmers in the Jefferson area. The number of instances of adoption of improved legume practices was 254 per 100 farms in the Jefferson area, 211 in the Cape Girardeau area, and 151 in the Scott area.

#### Kinds of Practices Adopted

Detailed information as to the nature of the legume growing practices adopted or changed as the result of legume extension is given by counties in Table 9. Alfalfa leads in the number of instances of changed practices, followed by red clover, soybeans, and sweet clover. On the basis of practices rather than crops, introduction accounted for nearly 40 percent of all practices adopted, followed by use of lime, good seed, inoculation, manure, and fertilizer in the order given.

Table 9 - Farms adopting improved practices in legume growing

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total	
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage
<u>Soybeans</u>								
Introduction	63	56.4	42	16.9	52	24.0	157	24.6
Inoculation	6	3.5	11	4.4	22	10.1	39	6.1
Lime	2	1.2	2	0.8	3	1.4	7	1.1
Fertilizer	-	-	1	0.4	-	-	1	0.2
Manure	3	1.7	5	2.0	1	0.5	9	1.4
Good seed	13	7.5	15	6.0	14	6.4	42	6.6
<u>Mixed clover</u>								
Introduction	10	5.8	16	6.4	7	3.2	33	5.2
Inoculation	-	-	3	1.2	2	0.9	5	0.8
Lime	1	0.6	7	2.8	3	1.4	11	1.7
Fertilizer	-	-	3	1.2	2	0.9	5	0.8
Manure	3	1.7	3	1.2	-	-	6	0.9
Good seed	2	1.2	8	3.2	1	0.5	11	1.7
<u>Red clover</u>								
Introduction	23	13.3	59	23.7	30	13.8	112	17.5
Inoculation	2	1.2	7	2.8	7	3.2	16	2.5
Lime	15	8.7	38	15.3	44	20.3	97	15.2
Fertilizer	1	0.6	13	5.2	8	3.7	22	3.4
Manure	12	6.9	28	11.2	8	3.7	48	7.5
Good seed	6	3.5	19	7.6	11	5.1	36	5.6
<u>Sweet clover</u>								
Introduction	15	8.7	22	8.8	22	10.1	59	9.2
Inoculation	8	4.6	13	5.2	9	4.2	30	4.7
Lime	10	5.8	13	5.2	13	6.0	36	5.6
Fertilizer	-	-	4	1.6	4	1.8	8	1.2
Manure	-	-	4	1.6	2	0.9	6	0.9
Good seed	5	2.9	10	4.0	6	2.8	21	3.3

Table 9 - Farms adopting improved practices in legume growing - Continued

Item	Scott County area (No conf's)		Cape Girardeau County area (3 conf's)		Jefferson County area (6 conf's)		Total
	Number	Percentage	Number	Percentage	Number	Percentage	Number Percentage
<u>Alfalfa</u>							
Introduction .....	19	11.0	40	16.1	80	36.9	139 21.8
Inoculation .....	4	2.3	23	9.2	53	24.4	80 12.5
Lime .....	10	5.8	35	14.1	67	30.9	112 17.5
Fertilizer .....	1	0.6	10	4.0	23	10.6	34 5.3
Manure .....	6	3.5	14	5.6	15	6.9	35 5.5
Good seed .....	6	3.5	22	8.8	31	14.3	59 9.2
<u>Lespedeza</u>							
Introduction .....	1	0.6	-	-	2	0.9	3 0.5
Inoculation .....	-	-	-	-	1	0.5	1 0.2
Lime .....	-	-	-	-	-	-	- -
Fertilizer .....	-	-	-	-	-	-	- -
Manure .....	-	-	-	-	-	-	- -
Good seed .....	-	-	-	-	-	-	- -
<u>Cowpeas</u>							
Introduction .....	12	7.0	19	7.6	3	1.4	34 5.3
Inoculation .....	-	-	1	0.4	1	0.5	2 0.3
Lime .....	-	-	-	-	-	-	- -
Fertilizer .....	-	-	-	-	-	-	- -
Manure .....	1	0.6	1	0.4	-	-	2 0.3
Good seed .....	1	0.6	3	1.2	-	-	4 0.6
<u>Other legumes</u>							
Introduction .....	1	0.6	7	2.8	4	1.8	12 1.9
Inoculation .....	-	-	1	0.4	-	-	1 0.2
Lime .....	-	-	1	0.4	1	0.5	2 0.3
Fertilizer .....	-	-	-	-	-	-	- -
Manure .....	-	-	1	0.4	-	-	1 0.2
Good seed .....	-	-	1	0.4	-	-	1 0.2
Total all legume practices .....	262	-	525	-	552	-	1339 -



## RELATIVE INFLUENCE OF MEANS AND AGENCIES

The effectiveness of the various means and agencies employed in legume extension teaching is best brought out by comparing the frequency with which each was reported as having contributed to the adoption of specific legume practices in each of the stages which the areas represent. (Table 10.) To facilitate the comparison the data have been computed to the basis - total influence of all methods equals 100 percent. Since the adoption of a single practice may be associated with two or more means and agencies, the percentages given in Table 10 indicate the relative influence of the means and agencies as compared to each other rather than the total percentages of practices in connection with which the particular means or agency was reported.

Table 10 - Methods influencing the adoption of improved legume practices.

Means or agency	Percentage <sup>1/</sup> of legume practices adopted in:			
	Scott	Cape	Jefferson	Total
	County area (No conf's)	Girardeau County area (3 conf's)	County area (6 conf's)	
Indirect influence .....	34.35	35.48	25.64	30.69
News story .....	14.32	19.63	16.70	17.35
Office call .....	19.30	14.92	7.28	12.21
Farm visit .....	12.24	6.41	11.26	9.78
Bulletin .....	7.06	9.16	7.18	7.84
Other meetings <sup>2/</sup> .....	4.94	4.19	8.64	6.40
Clover and prosperity conference	-	5.11	7.18	5.09
Result demonstration, adult .....	0.70	0.65	6.12	3.20
Circular letter .....	3.06	2.10	3.69	3.02
Correspondence .....	1.18	1.31	1.94	1.58
Poster or sign .....	-	-	2.62	1.22
Radio .....	-	0.26	1.07	0.59
Method demonstration meeting .....	1.41	-	0.58	0.54
Exhibit .....	0.47	0.65	0.10	0.36
Telephone .....	0.47	0.13	-	0.13

<sup>1/</sup> Computed to basis total influence of all methods equals 100 percent. Actually the adoption of a single practice frequently involves two or more means or agencies.

<sup>2/</sup> Information as to the number of other meetings held in each area since legume extension was started is not available but it is probable that the number of such other meetings held to discuss legume growing would greatly exceed the number of clover and prosperity conferences.



Indirect influence, that is, the spread of information regarding legume growing from one neighbor to another, explains the adoption of approximately 30 percent of all practices changed in the three areas studied. This indirect spread of better legume-growing practices was uniformly high in each of the areas, but was highest in the Cape Girardeau area and lowest in the Jefferson area. (Table 10.)

The extension news story was the next most important influence upon the adoption of legume practices, being credited with 18 practices out of 100 adopted. Its influence was uniformly high in all three areas, but yielded second place in relative effectiveness to office calls in the Scott County area.

Calls at the extension office influenced the adoption of 12 percent of the legume practices. The much larger influence of office calls in Cape Girardeau and Scott Counties is doubtless largely accounted for by the closer proximity of the areas studied in those counties to the county extension office than was true of the area in Jefferson County. The distance factor, however, does not account for the greater influence of office calls in the Scott as compared to the Cape Girardeau area. The differences in the distance from the area studied to the county agent's office in the three counties are brought out in Table 1.

The direct influence of the clover and prosperity conference type of meeting is, of course, largely dependent upon the number of such conferences held and the size and geographical distribution of the attendance obtained. Since the three areas were selected as representative of the stage of development of the legume program as expressed by the number of annual clover and prosperity conferences held, one would expect that the relative influence of such conferences would be in direct relationship to the number of such meetings held. As no county-wide legume conferences had been held in Scott County the only influence of this type of meeting on legume practices was confined to one farmer who had attended such a meeting held in another county. In the 3-conference area 5 percent of the practices adopted were credited to the clover and prosperity conferences whereas in the 6-conference area 7 percent of the practices were credited to this type of meeting.

Information could not be obtained as to the number of other meetings held in each of the three areas studied. It is probable, however, that the number of such other meetings at which legume extension information was presented would greatly exceed the number of clover and prosperity conferences held. Such other meetings were credited with having influenced the adoption of 6 percent of the legume practices, or approximately the same percentage as credited to the probably smaller number of clover and prosperity conferences. All types of meetings, including method demonstration meetings, were responsible for influencing the adoption of 12 percent of the legume practices. The influence of other meetings was highest in the area where the greatest number of clover and prosperity conferences had been held, indicating that the usefulness of the community types of meeting is not reduced by the holding of highly specialized county-wide meetings.

Farm visits were credited with having influenced 10 out of every 100 legume practices adopted, being highest in Scott and lowest in Cape Girardeau. The combined influence of farm visits and office calls accounted for 32 percent of the legume practices adopted in the Scott area.

Bulletins of the Missouri College of Agriculture and the U. S. Department of Agriculture had slightly less influence upon legume practices than did farm visits. (Table 10.) The influence of bulletins on the adoption of practices was lowest in the Scott area, but the difference between the no-conference area and the 6-conference area is too slight to be of any significance.

The influence of circular letters upon practices was slightly higher than the average in the Jefferson, and slightly lower than the average in the Cape Girardeau areas. On the whole the influence of circular letters was less than half that of bulletins.

Result demonstrations were credited with only slightly more direct influence upon the adoption of legume practices than were circular letters. The difference in effectiveness of result demonstrations in the Scott and Jefferson areas is largely a reflection of the emphasis placed upon them in those two areas. (Table 10.) The very low influence of result demonstrations upon legume practices in the Cape Girardeau area is only partially accounted for by the small amount of emphasis placed upon this teaching means.

With the exception of posters or signs in Jefferson County, which was the only area using them, the influence of the other means and agencies employed in legume extension was too small to warrant individual discussion. In the Jefferson area the rough inexpensive signs, placed in successful legume fields situated alongside the roads by the county agent to call attention to the pertinent facts regarding each, were mentioned as a factor in the adoption of nearly 3 percent of the legume practices.

#### Influence of Means and Agencies Compared with Other Studies.

It is of interest to compare the relative influence of the teaching means and agencies upon the adoption of improved legume practices, as brought out in this study, with the similar influence of means and agencies upon the adoption of legume practices in the 13 areas in 15 other States where extension studies have been previously conducted.

In the case of indirect influence, news story, office call, farm visit, bulletin, result demonstration, and correspondence, the means and agencies not only rank in the same order, but are credited with almost identical relative influence upon the adoption of legume practices in the Missouri study and in the studies made in other States. (Table 11.) Among the more important means and agencies the most striking dissimilarity is in the influence of meetings. The smaller influence of meetings upon adoption of practices in the Missouri areas is largely accounted for by the emphasis placed by the clover and prosperity program upon a few large county-wide meetings of picked delegates with correspondingly less attention to the holding of a larger number of the smaller community meetings.



No explanation is known for the greater influence of circular letters in the Missouri areas. The higher percentages of practices credited to posters and signs in the Missouri areas is explained by the extraordinary use the county agent in the Jefferson area made of signs in successful legume fields situated alongside roads to give pertinent facts associated with each.

#### Effectiveness of Means and Agencies as Related to Their Use.

In studying the effectiveness of the teaching means and agencies employed in forwarding the legume program it is desirable to compare the relative influence of each upon the adoption of practices with the amount of emphasis placed upon each. Such a comparison is of more than usual interest because of the three distinct stages in the development of the legume extension program represented by the three areas included in this study.

Table 11 - Methods influencing the adoption of legume practices compared with other States.

Means or agency	Percentage <sup>1/</sup> of legume practices	
	Missouri area	16 other areas
Indirect influence .....	30.96	25.65
News story .....	17.50	18.09
Office call .....	12.32	11.57
Meetings (all types) .....	11.27 <sup>2/</sup>	20.80
Farm visit .....	9.87	9.10
Bulletin .....	7.91	5.22
Result demonstration .....	3.23	5.29
Circular letter .....	3.04	1.41
Correspondence .....	1.59	1.34
Poster or sign .....	1.23	0.06
Radio .....	0.59	1.05
Exhibit .....	0.36	0.08
Telephone call .....	0.13	0.34

<sup>1/</sup> Computed to basis total influence of all methods equals 100 per cent.

<sup>2/</sup> Includes clover and prosperity conferences, method demonstration and other meetings.

Extent of use of means and agencies. The varying emphasis placed upon the different teaching means and agencies in the three areas is indicated by the percentages of people exposed to each in the different areas. (Table 12.) From 58 to 68 percent of the farmers included in the study had been exposed to legume extension information through news stories, circular letters, conversation with neighbors, and bulletins. The percentage of farmers attending one or more legume meetings was 41. The higher percentage of farmers in the Cape Girardeau area attending clover and prosperity conferences was more than offset by the percentage attending other meetings in the Jefferson area. Exposure to legume meetings was lowest in the Scott area where no legume conferences had been held.



The percentage of farmers making calls at the agent's office was highest in the Scott area, exceeding the percentage in that area reached through meetings. Approximately 61 percent of the farmers in the Jefferson area had seen the signs placed on legume fields as compared to 46 percent in the same area attending general meetings. Only one-third as many people saw legume extension exhibits in the Jefferson area as in the two other areas.

Considering all the teaching means and agencies employed in legume extension 93 percent of the farmers in all areas had been exposed to extension information, the variation being from 90 percent in the Cape Girardeau area, where three annual legume conferences had been held, to 97 percent in the Jefferson area with its 6 legume conferences.

Table 12 - Percentage of farmers exposed to various means and agencies.

Means or agency	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
News service .....	62.4	68.3	73.3	68.4
Circular letter .....	72.3	57.8	69.1	65.6
Indirect .....	59.0	60.2	71.0	63.5
Bulletin .....	52.6	53.0	68.2	58.0
General meetings <sup>1/</sup> .....	29.5	43.8	46.1	40.7
Clover and prosperity conferences .....	0.6	23.7	17.5	15.3
Other meetings <sup>2/</sup> .....	28.9	33.7	43.3	35.7
Office call .....	45.1	34.5	25.3	34.3
Farm visit .....	32.4	20.9	38.7	30.0
Poster or sign .....	1.2	4.4	60.8	22.7
Result demonstration, adult ..	15.6	10.4	31.3	18.9
Exhibit .....	18.5	19.3	6.5	14.7
Radio .....	5.8	15.7	20.3	14.6
Method demonstration meeting ..	8.1	8.0	14.7	10.3
Correspondence .....	5.2	8.4	15.7	10.0
Telephone .....	4.6	9.6	1.8	5.6
Any method .....	92.5	90.0	97.2	93.1

<sup>1/</sup> General meetings (the combination of clover and prosperity conferences and other meetings) is entered to permit comparison with studies in other States.

<sup>2/</sup> Information as to the number of other meetings held in each area since legume extension was started is not available but it is probable that the number of such other meetings held to discuss legume growing would greatly exceed the number of clover and prosperity conferences.

Table 13 - Percentage of farmers influenced by various means and agencies to adopt legume practices

Means or agency	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Indirect.....	41.6	46.6	52.1	47.1
News service .....	21.4	27.7	35.0	28.5
Office call .....	26.0	14.9	14.7	17.8
General meetings <sup>1/</sup> .....	8.1	11.6	22.6	14.4
Clover and prosperity conferences .....	-	7.2	9.7	6.1
Other meetings <sup>2/</sup> .....	8.1	5.6	17.0	10.2
Farm visits .....	15.0	6.4	18.9	13.0
Bulletin .....	9.2	10.4	18.0	12.7
Circular letter .....	5.8	4.0	10.6	6.7
Result demonstration, adult .....	1.7	1.2	10.6	4.5
Poster or sign .....	-	-	8.3	2.8
Correspondence .....	2.3	1.6	4.1	2.7
Radio .....	-	0.8	2.8	1.2
Method demonstration meeting .....	1.7	-	1.4	0.9
Exhibit .....	1.2	0.8	0.5	0.8
Telephone .....	1.2	0.4	-	0.5
Any method .....	60.7	59.8	72.8	64.5

<sup>1/</sup> General meetings (the combination of clover and prosperity conferences and other meetings) is entered to permit comparison with studies in other States.

<sup>2/</sup> Information as to the number of other meetings held in each area since legume extension was started is not available but it is probable that the number of such other meetings held to discuss legume growing would greatly exceed the number of clover and prosperity conferences.

Ratio of takes to exposures. By comparing the number of farmers exposed to each of the teaching means and agencies (Table 12) with number of farmers reporting that means or agency as having influenced the adoption of one or more legume practices (Table 13), it is possible to compute the ratio of takes to exposures for each means and agency. (Table 14).

Arranging the means and agencies in descending order for the total of the three areas according to the ratio of farmers influenced to adopt practices to farmers exposed to legume information, indirect spread from neighbor to neighbor heads the list with a ratio of 70 percent or higher in all three areas studied. (Table 14.) Office calls rank second in all areas with a ratio varying from 43 to 58 percent. Farm visits, news articles, general meetings, and personal letters follow in that order considering the three areas studied as a whole. The ranking of these teaching means and agencies in the separate areas is also quite similar.

Approximately one farmer out of four who visited a legume result demonstration was influenced by the demonstration to adopt improved legume practices. The relationship varied from one out of three in Jefferson County to one out of nine in the Scott and Cape Girardeau areas.

Bulletins had only a slightly lower ratio of takes to exposures than did result demonstrations. The effectiveness of bulletins was also quite uniform throughout the three areas.

The method demonstration was more effective in relation to its use in Scott County than in the other two areas. Circular letters influenced from 7 to 15 percent of the farmers receiving them in the areas studied. The ratio of takes to exposures for exhibits was uniformly low in all the areas studied.

Considering all the means and agencies to which exposed, the relationship of those influenced to adopt legume practices to those exposed was quite uniform, the ratio in the Scott and Cape Girardeau areas being 66 percent and in the Jefferson area 75 percent, with an average of 69 percent for all three areas.



Table 14 - Percentage of farmers exposed to means and agencies  
who were influenced to adopt legume practices.

Means or agency	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Indirect .....	70.6	77.3	73.4	74.1
Office call .....	57.7	43.0	58.2	52.0
Farm visit .....	46.4	30.8	48.8	43.2
News service .....	34.2	40.6	47.8	41.6
General meetings <sup>1/</sup> .....	27.4	26.6	49.0	35.4
Clover and prosperity con- ferences .....	-	30.5	55.3	39.8
Other meetings <sup>2/</sup> .....	28.0	16.7	39.4	28.5
Correspondence .....	44.4	19.0	26.5	26.6
Result demonstrations, adult	11.1	11.5	33.8	24.0
Bulletin .....	17.6	19.7	26.4	21.8
Poster or sign .....	-	-	13.6	12.4
Circular letter .....	8.0	6.9	15.3	10.3
Method demonstration meeting	21.4	-	9.4	9.1
Radio .....	-	5.1	13.6	8.6
Telephone .....	25.0	4.2	-	8.3
Exhibit .....	6.2	4.2	7.1	5.3
Any method .....	65.6	66.5	74.9	69.2

<sup>1/</sup> General meetings is the combination of clover and prosperity conferences and meetings other than method demonstration meetings.

<sup>2/</sup> Information as to the number of other meetings held in each area since legume extension was started is not available but it is probable that the number of such other meetings held to discuss legume growing would greatly exceed the number of clover and prosperity conferences.

It is also interesting to consider the relationship of those influenced to those exposed to legume extension, in the light of the three stages of the development of the legume program represented in the areas studied. News stories, circular letters, bulletins, meetings other than method demonstration meetings, result demonstrations, signs, and radio were apparently more effective in relation to use in the area most advanced in the legume program. In the case of indirect spread, office calls, farm visits, and exhibits, the ratios of takes to exposures were approximately the same in the least advanced and in the most advanced areas. The ratios for method demonstration meetings, correspondence, and telephone calls were higher in the no-conference area than in the area having held six annual legume conferences.

Clover and prosperity conferences vs. other meetings. Inasmuch as the annual legume conference of picked delegates meeting on a county-wide basis is a distinct characteristic of the Missouri extension program with legumes, it is of interest to compare such meetings with the ordinary type of community extension meeting as to effectiveness.

The attendance at the clover and prosperity conferences was greater than the number of designated delegates to the conference. This was particularly true in the Cape Girardeau area where there were approximately two other farmers in attendance for every official delegate. (Table 15.)

Table 15 - Clover and prosperity conferences and other meetings compared

Item	Scott County area (No conf's)	Cape Girardeau County area (3 conf's)	Jefferson County area (6 conf's)	Total
Farm records obtained .....	173	249	217	639
Percentage farmers serving as delegates to clover and prosperity conferences .....	0.6	8.8	12.4	7.8
Percentage farmers in attendance at:				
Clover and prosperity conferences	0.6	23.7	17.5	15.3
Other meetings <sup>1/</sup> .....	28.9	33.7	43.3	35.7
Percentage farmers influenced to adopt practices by:				
Clover and prosperity conferences	-	7.2	9.7	6.1
Other meetings <sup>1/</sup> .....	8.1	5.6	17.0	10.2
Ratio of takes to exposures:				
Clover and prosperity conferences	-	30.5	55.3	39.8
Other meetings <sup>1/</sup> .....	28.0	16.7	39.4	28.5
Percentage practices adopted influenced by:				
Clover and prosperity conferences	-	5.1	7.2	5.1
Other meetings <sup>1/</sup> .....	4.9	4.2	8.6	6.4

<sup>1/</sup> Information as to the number of other meetings held in each area since legume extension was started is not available but it is probable that the number of such other meetings held to discuss legume growing would greatly exceed the number of clover and prosperity conferences.



The ratio of takes to exposures was much higher for the clover and prosperity conference than for other meetings in both the Cape Girardeau and the Jefferson areas and much higher for both the legume conference and for other meetings in the Jefferson than in the Cape Girardeau area. (Table 15.) A larger percentage, however, of those attending general meetings in Scott County were influenced to adopt practices than of those attending one or more legume conferences in the Cape Girardeau area.

It would seem only logical that the proportion of farmers attending the county clover and prosperity conferences who were influenced to adopt legume practices, should be higher than in the case of those attending extension community meetings where legume growing was discussed. In the first place those in attendance at the clover and prosperity conferences were farmers especially invited because of their standing in the county and their probable interest in legumes. Then too the clover and prosperity conferences were held on a county-wide basis with the program limited to various angles of legume growing. Such meetings would naturally attract chiefly those farmers sufficiently interested in legumes to travel the distance required to participate in such a meeting at the county seat.

In the Jefferson area particularly many of the delegates had been in attendance at several annual conferences resulting in a cumulative effect of these specialized meetings.

A comparison of those officially designated as delegates from their respective communities to the clover and prosperity conferences with all the farmers interviewed in the areas studied (Table 16) indicates that the higher percentages of clover and prosperity delegates reporting the adoption of legume practices as compared to all farmers in the same areas, is probably due to the greater number of contacts with legume extension activities.

Table 16 - Delegates to clover and prosperity conferences compared to all farmers

GROUP	Number of farmers in group	Percentage farmers adopting legume practices	Number of practices adopted per 100 farms	Average number of agencies to which exposed	Percentage of means and agencies to which exposed, reported as having influenced adoption of practices
Clover and prosperity delegates -					
Cape Girardeau (3 conferences)	22	81.8	409	7.3	36.0
Jefferson (6 conferences) ...	27	88.9	567	9.7	38.0
Total delegates .....	49	85.7	496	8.6	37.3
All farmers -					
Scott (no conferences) .....	173	60.7	151	4.5	32.8
Cape Girardeau (3 conferences)	249	59.8	211	4.8	29.8
Jefferson (6 conferences) ...	217	72.8	254	5.7	36.5
Total all farmers .....	639	64.5	210	5.0	33.3



On the basis of the percentage of means and agencies to which exposed reported as having been a contributing influence upon the adoption of legume practices, the 1.5 percent advantage of the delegate group over all farmers in the Jefferson area is too small to be of much significance. The data from this study would seem to indicate that the higher percentage of delegates to clover and prosperity conferences adopting legume practices is largely a question of increased exposure to legume extension information.

#### Importance of Several Kinds of Exposures.

The study does not furnish data as to the number of legume meetings attended, the number of office calls, farm visits, and the like, to which each farmer was exposed. Information is supplied, however, as to the different kinds of teaching activities employed in legume extension to which each farmer had been exposed. Sorting the records according to the number of different teaching means and agencies to which exposed brings out clearly the importance of presenting extension information in several ways.

Table 17 - Adoption of legume practices as affected by number of ways extension information was received

Number of means and agencies to which exposed	Number of farms in group	Percentage of farms adopting legume practices	Number of practices adopted per 100 farms	Percentage of means and agencies to which exposed, reported as having influenced adoption of practices
0	44	-	-	-
1 to 2	117	41.0	74	34.6
3 to 4	172	58.7	123	28.4
5 to 6	145	81.1	248	33.0
7 to 8	92	83.7	336	32.4
9 to 10	41	97.6	395	35.2
11 to 15	30	100	720	40.6

Where farmers had been exposed to but one or two means employed in legume extension 41 percent adopted practices as compared to 100 percent where information had been received in 11 or more ways. After legume information has been received in 5 or 6 ways the percentage increase in farmers adopting practices is much less than for 0 to 5 ways, indicating the importance of first getting the information before additional farmers rather than continuing to do more work with the same groups.

It is also interesting to note that the percentages of means and agencies to which exposed, which were also reported as having influenced adoption of legume practices, remains quite constant for the groups with less than 11 kinds of exposures (Table 17). The apparent rise in percentage after 11 exposures may be due to the small number of farms in the group.

Repeating the lesson in different ways has long been recognized as fundamental to good teaching. Objective proof of the value of repetition and variation in extension teaching is brought out for the first time by this study.

## OTHER FACTORS AFFECTING THE ADOPTION OF LEGUME PRACTICES

In addition to the means and agencies employed in extension teaching, it is well to consider other factors which may have influenced the adoption of legume practices. Since these factors have little, if any, relationship to the stages of development of the legume program represented by the three areas included in the study, the data for the individual areas have been combined.

### Tenure

Approximately three-fourths of the farms studied were operated by the owners and one-fourth by tenants. The percentages of those exposed to legume information, and adopting legume practices, and the ratio of takes to exposures are slightly higher for owner operators than for tenant operators. (Table 18.) The length of time the operator had lived on his present farm, whether more than 10 years or less than 10 years, seems to have had little influence upon the use of extension information either in the case of owner operators or in the case of tenant operators.

### Size of Farm

Size of farm, expressed in acres in cultivation, seems to have had little bearing upon the adoption of legume practices. (Table 19.) The slightly larger percentages of farmers on farms of more than 75 acres who were exposed to legume extension and who reported the adoption of legume practices are of little significance. Expressing size in terms of the amount of livestock kept (Table 20) it is found that where 10 or more animal units were kept the proportion of farmers adopting legume practices was considerably higher than where less than 10 units of livestock were kept. This difference is accounted for by the higher ratio of takes to exposures since the farmers in all three groups had been exposed about equally to legume extension teaching. Additional livestock beyond 20 units does not seem to have been a factor in promoting the use of legume extension information.

### Distance from Extension Office

When the farms are sorted according to distance from the county extension office, it is found that the farms closest in and farthest away were more effectively reached by the legume extension program than were the farms 6 to 9 miles away. (Table 21.) This may be less significant than it would appear because two of the areas studied were contiguous to the local extension office, while in the third area all or very nearly all of the farms surveyed would fall in the 10-miles-and-over group. Nevertheless, one may conclude that in this study distance from the county extension office, of itself, does not appear to be an important factor in the dissemination and use of legume extension information.



Table 18 - Condition and length of tenure in relation to exposure to extension information and the adoption of legume practices

Tenure	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
Owners .....	488	94.5	66.6	221	70.5
1 to 10 years .	186	92.5	68.8	223	74.4
Over 10 years .	302	95.7	65.2	220	68.2
Tenants .....	151	88.7	57.6	172	64.9
1 to 10 years .	119	88.2	57.1	160	64.8
Over 10 years .	32	90.6	59.4	212	65.5
Owners and tenants:					
1 to 10 years .	305	90.8	64.3	199	70.8
Over 10 years .	334	95.2	64.7	219	67.9

Table 19 - Acres in farm in relation to exposure to extension information and the adoption of legume practices

Acres in cultivation	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
0 to 75 ...	306	91.5	60.8	201	66.4
76 to 150 ..	260	94.6	68.8	218	72.8
151 and over	73	94.5	64.4	212	68.1



Table 20 - Livestock kept as related to exposure to extension information and the adoption of legume practices.

Number of animal units	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
0 to 9 .....	201	90.5	53.7	147	59.3
10 to 19 .....	250	93.6	68.8	218	73.5
20 and over .....	183	95.2	70.2	266	73.7

Table 21 - Distance from extension office as related to exposure to extension information and the adoption of legume practices

Distance from extension office	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
0 to 5 miles .....	175	97.1	68.6	244	70.6
6 to 9 miles .....	199	88.9	53.8	144	60.4
10 and over .....	265	93.6	69.8	236	74.6

#### Character of Roads.

Where the farm was situated on a road passable at all seasons of the year a somewhat higher percentage of the farmers had been exposed to legume extension information than was true of the farmers living on the poorer roads. (Table 22.) The farmers living on improved, but not all-weather roads, were reached somewhat more effectively than farmers living on roads totally unimproved. Good roads facilitate attendance at meetings and other contacts with extension workers.

Table 22 - Kind of road in relation to exposure to extension information and the adoption of legume practices.

Kind of road	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
All weather .....	353	96.9	67.7	235	69.9
Improved .....	226	89.4	62.4	190	69.8
Unimproved .....	60	85.0	53.3	132	62.7

#### Educational Training of Farmers.

Practically as high a percentage of the farmers with common school education or less were exposed to legume extension activities as was true of the farmers with more than common school training. (Table 23.) Substantially higher percentages of the college and high school groups, however, made use of information obtained from extension in the growing of legumes on their farms. According to the limited information made available from this one study, training beyond high school was not associated with an increased percentage adopting extension practices. Other studies, however, indicate that college training does result in increased use of extension information.<sup>1/</sup>

Table 23 - Educational training as related to exposures to extension information and the adoption of legume practices

Education	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
Common school .....	588	93.0	63.3	197	68.0
Some high school, but no college ..	36	94.4	80.6	339	85.3
Some college .....	15	93.3	73.3	387	73.6

<sup>1/</sup> Wilson, H. C., and Brokaw, W. H., Extension Results as Influenced by Various Factors, Nebraska Ext. Circ. 25.



## Age of Farmers.

When the farmers interviewed are classified according to age, it is evident that not only fully as high percentage of the older men were exposed to legume extension information as was true of the younger farmers, but the percentages of those exposed who actually applied the information on their farms compare very favorably with the corresponding percentages for the younger age groups. (Table 24.) There is little variation in the percentage of farmers between the ages of 31 and 35 years and 56 and 60 years who adopted improved legume practices. Age in itself offers little barrier to the extension of legume subject matter.

Table 24 - Age of farmers in relation to exposure to extension information and the adoption of legume practices

Age	Number of farms in group	Percentage exposed to extension information	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
30 and under .....	39	94.9	48.7	136	51.4
31 to 35 .....	71	83.7	71.8	238	81.0
36 to 40 .....	92	96.7	68.5	248	70.8
41 to 45 .....	70	94.3	64.3	236	68.2
46 to 50 .....	92	93.5	63.0	326	67.4
51 to 55 .....	72	93.0	70.8	204	76.1
56 to 60 .....	69	94.2	65.2	190	69.2
61 and over .....	134	91.0	59.7	178	65.6

## Contact with Extension Activities.

All of the factors previously discussed are largely, if not entirely, beyond the control of extension workers. The extent to which farmers participate in meetings, attend auto tours and result demonstrations, and come into personal contact with the extension agent and the legume program, however, is largely dependent upon how the agent carries on his work and the teaching means and agencies he employs.

The very great importance of agents and specialists so planning and conducting legume extension as to bring as many people as possible into contact with legume extension activities is clearly emphasized in Table 25. All of the farmers participating in legume extension activities or otherwise making direct contact with extension workers were, of course, exposed to extension information which resulted in 77 percent of them adopting recommended legume practices on their farms. It is of interest to note that 81 percent of those without direct contacts with extension activities and workers had received legume information through talking with neighbors who may have had direct contact with agents, through reading about the work in local papers, and in other indirect ways. Slightly more than half of this group made use of legume extension information but the number of practices adopted per 100 farms was 84 for this group as compared to 281 for the contact group.



There is, of course, a close relationship between the data presented in Table 25 and the data on exposures to legume extension information included in Tables 12 to 14.

Table 25 - Contact with extension activities in relation to exposure to extension information and the adoption of legume practices.

Group	Number of farms in group	Percentage exposed to extension informa- tion	Percentage farmers adopting legume practices	Number practices adopted per 100 farms	Percentage exposed who were influenced
Contact with activities	408	100	77.0	281	77.0
No contact .....	231	81.0	42.4	84	52.4

### SUMMARY AND CONCLUSIONS

The study here reported was made for the purpose of obtaining both a general picture of the results of legume extension work in Missouri and detailed information regarding the results at different stages in the development of the state-wide legume program.

As the stage of the legume program advanced there was a sharp increase in the percentage of farmers who attributed legume failure to specific causes, other than weather, which are subject to control.

The percentage of farmers using limestone in 1929 and during the preceding 10 years increased directly with the advancing stage of the legume program.

The amount of limestone used per farm using limestone was also greatest in the area most advanced in the legume extension program.

In general the use of the various legume crops increased between 1924 and 1929 and for most of the major legumes the use of the various treatments to improve legume production increased as the stage of development of the legume program advanced.

The percentage of farmers in any way exposed to legume extension, and the percentage adopting improved legume practices due to extension influence were approximately the same for the no-conference and the 3-conference stages of the legume program. In the 6-conference stage the percentage of farmers exposed and influenced to adopt improved legume practices was markedly higher than in the less advanced areas. The number of legume practices adopted per 100 farms varied directly with the stage of the legume program. The percentage of farmers influenced by extension to grow alfalfa, the most satisfactory but most difficult of the legumes to grow, was noticeably higher in the 6-conference area than in the other two areas.

News stories, office calls, meetings, farm visits, bulletins, and indirect spread from neighbor to neighbor were credited with having influenced approximately 90 percent of the legume practices adopted. In general the means and agencies had about the same relative value in influencing the adoption of legume practices in the Missouri areas studied as in the areas studied in 15 other States. Bulletins, circular letters, and signs had a slightly larger influence but meetings and result demonstrations had a smaller influence in the areas included in this study than in areas previously studied in other States.

The different stages of the legume program and individual preferences of the extension agents involved naturally resulted in widely varying emphasis upon the teaching means and agencies employed in the three areas studied. Where the effectiveness of the means and agencies were studied in light of their use it was found that news stories, circular letters, bulletins, meetings other than method demonstration meetings, result demonstrations, and radio all had a higher ratio of takes to exposures in the area most advanced in the legume program. Indirect spread, office calls, farm visits, and exhibits had approximately the same ratio in the least advanced and in the most advanced areas. The ratios of method demonstration meetings, correspondence, and telephone calls were higher in the no-conference area than in the 6-conference area.

The higher ratio of takes to exposures for the clover and prosperity conferences as compared to other meetings would seem to be largely accounted for by the fact that those in attendance at the legume conferences were selected delegates, who were naturally more frequently exposed to legume extension activities than were ordinary farmers.

The most significant contribution to extension teaching brought out by this study is the objective proof of the value of repetition and variation. There is a direct positive relationship between the number of ways in which farmers were exposed to legume extension information and the percentage of farmers adopting legume practices and the number of practices adopted per farm. Not only should an extension worker so organize and conduct his work that large numbers of farmers are brought into contact with extension teaching, but the teaching procedure should insure each farmer being exposed to information regarding improved practices in several different ways.

As in previous studies the adoption of legume practices seems to be little affected by condition of land tenure, size of farm, kind of roads, distance from the extension office, and age of farmers.







